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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/669,280	09/26/2000	Chae Hun Chung	13424.5US01	5676
23552	7590	12/08/2004	EXAMINER	
MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			KUMAR, PANKAJ	
			ART UNIT	PAPER NUMBER
			2631	

DATE MAILED: 12/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/669,280

Applicant(s)

CHUNG, CHAE HUN

Examiner

Pankaj Kumar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 8 is/are rejected.
- 7) ☒ Claim(s) 2-7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**1. DETAILED ACTION**

**2. *Response to Arguments***

3. Applicant's arguments filed 8/11/2004 have been fully considered but they are not persuasive.

4. Applicant argues that claim 1 is converting from RF to digital signals in a single step (Applicant's remarks page 7 2<sup>nd</sup> paragraph in the rejection section). This is not persuasive since applicant has not claimed to convert from RF to digital signal in a single step. Also, the claim says that it goes from RF to IF and then to baseband and hence the claim does not seem to read to convert in a single step.

5. Applicant argues that the conversions are to occurring sequentially (Applicant's remarks page 8 3<sup>rd</sup> line). This is not persuasive since applicant has not claimed this feature.

**6. *Response to Amendment***

**7. *Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

9. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling 5422908 in view of Posti 6788729. Here is how the references teach the claims:

11. As per claim 1, Schilling teaches a radio frequency (RF) receiver for a code division multiple access (CDMA) mobile communication base station system, which has a plurality of

receive blocks for receiving RF signals via a plurality of antennas, and a plurality of FA-based channel cards, the RF receiver comprising: an analog down-converting means for down-converting multi-FA RF signals on the respective reception paths output from the plural receive blocks to intermediate frequency (IF) signals (Schilling fig. 3: 21, 22 RF/IF have respective reception paths; col. 5 last paragraph which runs into col. 6 describes section 22 and then indicates multiple channels or multi-FA); and a digital down-converting means for converting the IF signals of 3 FA's on the respective reception paths output from the analog down-converting means to digital signals by reception paths (Schilling fig. 3: 23, 24; col. 5 last paragraph which runs into col. 6 describes multiple channels or multi-FA, this includes 3-FA's), dividing the digital signals into in-phase (I) and quadrature (Q) channels (Schilling fig. 3: output of 21 and 22 are I and Q), converting the divided digital signals into I/Q channel baseband signals (Schilling fig. 3: output of 40 going to data demodulation which will convert the signals to baseband), and outputting the FA-based I/Q channel baseband signals to the channel cards corresponding to the respective FA's (not in Schilling but would be obvious as explained below).

12. Schilling does not teach dividing the digital signals into in-phase (I) and quadrature (Q) channels of the FA's. Schilling teaches I/Q before the A/D instead of the claimed after the A/D. It is common knowledge to reverse parts of an invention. It would have been obvious to one skilled in the art at the time of the invention to modify Schilling to teach I/Q after the A/D. One would be motivated to do so since one achieves greater accuracy by dividing digital signals into I and Q components rather than analog signals.

13. Schilling does not teach outputting the FA-based channel baseband signals to the channel cards corresponding to the respective FA's. Posti teaches outputting the FA-based channel

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baseband signals to the channel cards corresponding to the respective FA's (Posti fig. 3: 127a, 127b, 124, 122a-f). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the outputting the FA-based channel baseband signals to the channel cards corresponding to the respective FA's as recited by the instant claims, because the combined teaching of Schilling with Posti suggest frequency based channel processing as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Schilling with Posti because Schilling suggests in fig. 3 baseband processing with the demodulation circuitry (something broad) in general and Post suggests the beneficial use of the specific baseband processing circuitry, such as frequency hopping, in the analogous art of frequency based channel processing.

14. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling 5422908 in view of Posti 6788729 and further in view of Feher 6,665,348. Here is how the references teach the claims:

15. As per claim 8: An RF receiver for a CDMA mobile communication base station system, which has two receive blocks for receiving RF signals via two antennas, and FA-based channel cards, the RF receiver comprising: an analog down-converter for down-converting multi-FA RF signals on first and second reception paths output from the two receive blocks to IF signals (Schilling fig. 3: 21, 22 RF/IF have respective reception paths; col. 5 last paragraph which runs into col. 6 describes section 22 and then indicates multiple channels or multi-FA); two analog-to-digital converters for converting the down-converted IF signals on the first and second reception paths from the analog down-converter to digital signals (Schilling fig. 3: 23, 24); FA-based

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digital units on the first and second reception paths for dividing the digital signals output from the two analog-to-digital converters into FA-based I and Q channels (Schilling fig. 3: output of 21 and 22 are I and Q) on the first and second reception paths to perform QPSK demodulation (not in Schilling but would be obvious as explained below), and down-converting the I/Q channel digital signals to baseband signals (Schilling fig. 3: output of 40 going to data demodulation which will convert the signals to baseband) (Schilling has demodulation but not QPSK demodulation but QPSK would be obvious as explained below); and a multiplexer for multiplexing the first and second reception paths and the I/Q channel baseband signals on the first and second reception paths output from the FA based digital units and outputting the multiplexed digital signals to the channel cards corresponding to the respective FA's (not in Schilling but would be obvious as explained below).

16. Schilling does not teach dividing the digital signals into in-phase (I) and quadrature (Q) channels of the FA's. Schilling teaches I/Q before the A/D instead of the claimed after the A/D. It is common knowledge to reverse parts of an invention. It would have been obvious to one skilled in the art at the time of the invention to modify Schilling to teach I/Q after the A/D. One would be motivated to do so since one achieves greater accuracy by dividing digital signals into I and Q components rather than analog signal.

17. Schilling does not teach QPSK demodulation. Feher teaches QPSK demodulation (Feher paragraph 97: "In this FIG. 30 demodulation of FQPSK type of signals, by using quadrature demodulation structures such as QPSK ..."; fig. 30). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the QPSK demodulation as recited by the instant claims, because the combined teaching of Schilling with Feher suggest

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QPSK demodulation as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Schilling with Feher because Schilling suggests demodulation (something broad) in general and Feher suggests the beneficial use of QPSK demodulation, such as interoperability or operating with QPSK based transmission, in the analogous art of frequency based channel processing.

18. Schilling does not teach outputting multiplexed multi-FA signals. Posti teaches this in fig. 3: 127a, 127b, 124, 122a-f and col. 5 lines 61-67: “each multiplexing means 127 can channel an equal number of signals as there are baseband processing means”. Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the outputting multiplexed multi-FA signals as recited by the instant claims, because the combined teaching of Schilling with Posti suggest frequency based channel processing as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Schilling with Posti because Schilling suggests in fig. 2 having multiple frequencies (something broad) in general and Post suggests the beneficial use of the multiplexing the multiple frequencies, such as frequency hopping, in the analogous art of frequency based channel processing.

#### **19. Allowable Subject Matter**

20. Claims 2-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**21. Conclusion**

22. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

23. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



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24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (571) 272-3011. The examiner can normally be reached on Mon, Tues, Thurs and Fri after 8AM to after 6:30PM.

25. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

26. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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M. Gh-  
MOHAMMED GHAYOUR  
SUPERVISORY PATENT EXAMINER